

39. Physiological steal around AVMs of the brain is not equivalent to cortical ischemia.

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Abstract

To challenge the concept of steal rendering the surrounding cortex ischemic, we examined patterns of nutritive capillary flow in the vicinity of AVMs. With a spectrophotometer (EMPHO, BGT) capillary O₂ saturation (O₂ satn.) was intraoperatively scanned around AVMs in n = 44 patients and in n = 42 controls. 130,000 O₂ satn. values before AVM resection were calculated as medians, ratio of critical values (< 25% O₂ satn.), coefficients of variance and compared via ANOVA (p < 0.05). n = 40 AVM patients had no postoperative complication (group A), while in n = 4 cases a hyperperfusion syndrome occurred (group B). Physiological variables were comparable among groups A, B and C (controls). Medians (A: 52.9+/-16.3, B: 44.2+/-17.1, C: 51.9+/-11.5% O₂ satn.) and the ratio of critical values (A: 6.5+/-5.1, B: 14.7+/-11.1, C: 7.1+/-4.9 O₂ satn.) were identical in groups A and C, but significantly different in group B, indicating exhausted compensation. Decreased flow heterogeneity in group A (A: 20.2+/-12.7, B: 27.9+/-12.4, C: 26.8+/-10.9 O₂ satn.) kept median cortical perfusion identical to group C. These results confirm recent findings, that cerebrovascular adaptation by capillary recruitment keeps CBF at normal levels in the majority of cases and that chronic noninfarctional cerebral hypoperfusion is eventually the equivalent of steal around AVMs. Only around AVMs predisposed to hemodynamic derangement some areas of local low flow anoxia may exist.

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